

549, 865

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 October 2004 (21.10.2004)

PCT

(10) International Publication Number
WO 2004/090516 A1

(51) International Patent Classification⁷: **G01N 21/64**,
21/95, G01R 31/265

(21) International Application Number:
PCT/GB2004/001521

(22) International Filing Date: 8 April 2004 (08.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0308182.5 9 April 2003 (09.04.2003) GB

(71) Applicant (for all designated States except US): **AOTI
OPERATING COMPANY, INC.** [US/US]; 131 NW
Hawthorne Avenue, Suite 207, Bend, OR 97701 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **HIGGS, Victor**
[GB/GB]; 222 Maylands Avenue, Hemel Hempstead,
Hertfordshire HP2 7DF (GB).

(74) Agent: **NOVAGRAAF PATENTS LIMITED**; The Cres-
cent, 54 Blossom Street, York YO24 1AP (GB).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

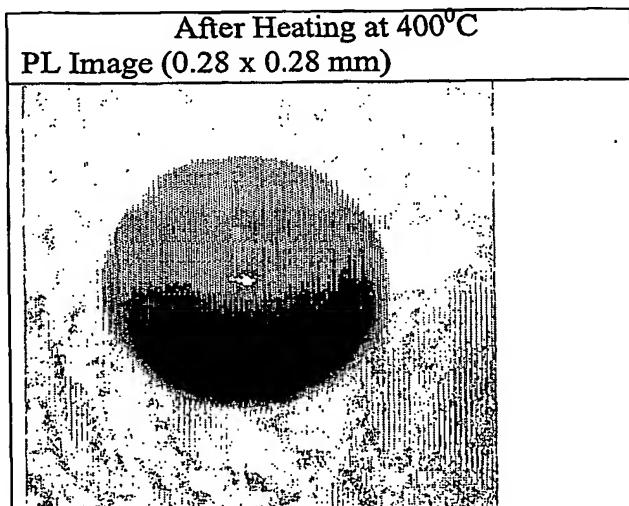
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: DETECTION METHOD AND APPARATUS METAL PARTICULATES ON SEMICONDUCTORS



(57) Abstract: A method of detecting surface
particulate defects, and especially metal particulates, in
semiconductors such as silicon, to characterise defects
likely to have an effect on the electrical activity of such
semiconductor materials, comprises exposing the surface
of the semiconductor structure in the vicinity of a surface
particulate to at least one high-intensity beam of light
and collecting and processing the photoluminescence
response; and using the result to identify unacceptable
contamination levels resulting from diffusion of
contaminant from particulate into semiconductor
structure. Optionally, the semiconductor is annealed
and photoluminescence responses collected before and
after annealing to identify contaminant diffusion rates.
Apparatus for the same is also described.

WO 2004/090516 A1